Weber County Industrial Development Corporation • balanced growth

BAMBERGER SQUARE, SUITE 11
205 26TH STREET
OGDEN, UTAH 84401
(801) 627-1333

April 15, 1981

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Mr. Dale Carpenter, Director
Utah Community and Economic Development
231 East 400 South
Salt Lake City, UT 84111

Dear Mr. Carpenter:

This is to advise that our Corporation fully supports proposed pond expansion north and west of existing evaporation ponds of the Great Salt Lake Minerals and Chemicals Corporation.

For more than a decade GSL has made significant contributions to the State of Utah and Weber County through lease payments of $637,500 plus royalty payments and taxes and has provided much needed employment to more than 300 persons. GSL has operated during this period of time in an environmentally safe, pollution-free manner and in full compliance with regulations of various departments under the jurisdiction of the Utah State Department of Natural Resources.

At this critical juncture the State has acknowledged the need to increase its tax base through environmentally safe development of its natural resources. It is inconsistent with this objective not to permit expansion by GSL when prior experience and evidence reflects total cooperation and compliance. It is further inconsistent since denial would limit increased taxes to Box Elder County and Weber County.

It is our desire that this matter be expeditiously resolved in the best interest of all the concerned parties.

Sincerely,

C. L. Jeanselme
Executive Director

CLJ/mg

GREAT SALT LAKE MINERALS & CHEMICALS CORPORATION
A SUBSIDIARY OF GULF RESOURCES & CHEMICAL CORPORATION
P. O. BOX 1190 o 765 NORTH 10500 WEST o OGDEN, UTAH 84402 TEL. (801) 731-3100 o TWX (910) 971-5910

GSL POND EXPANSION

DESCRIPTION AND HYDRAULIC ANALYSIS

1. SITUATION

GSL intends to expand the existing pond system covering 17,000 acres to the west by additional 17,000 acres. Between the new enlarged pond system and the eastern shore of Promontory an area 4,000-5,000 feet wide will allow the Bear River to flow south into the Great Salt Lake.

2. CONSTRUCTION DETAIL

The pond dikes will be constructed from imported gravel on the surface of the mud flat. The surface elevation of the flat will be 4,196 feet above sea level or higher wherever possible. Crest of the dikes will be at 4,203 and the width 25 feet. To move the material from borrow pits on Promontory to the area, two dike roads have to be built from the shoreline to the pond perimeter across the river channel to the northwest and southwest corners of the new pond area. The connection will be similar to pond dikes. To allow the river to flow, culverts will be installed in the southern road. The northern road will be removed after completion of construction.

3. MITIGATION OF POSSIBLE IMPACT ON WILDLIFE

The area which will be covered by new ponds has been under water during periods of higher lake levels and dry mud flat in periods of lower lake levels.

The new dikes including the river crossing allow to control the flow of water into the lake and to maintain a desirable water level in the area between GSL, pond, and the Bear River MBR. As beneficial to wildlife the Bird Refuge has proven to be, so will this area enhance wildlife in the future.

Control target is a slowly rising level through spring and summer into October hunting season then evacuation. Water level in the area is determined by:

Inflow - uncontrollable
Evaporation - uncontrollable
Inventory change - partially controllable
Outflow - controllable

All available data for inflow and tables for volume change and outflow under various conditions will be used to determine control activities. Control activity will merely consist of monitoring actual inflow and projected inflow for the coming period, long and short. With the desired level change and actual level at the period, required outflow volumes can be determined. Evaporation in the area as well as in Bear River Refuge and precipitation has to be considered also. Assumptions for the normal seasonal plan have to be monitored and if necessary revised. Time for consideration and control are available because volumes above normal operating level are so large that several days of abnormal high flow are required to raise the level by one foot.

4. DESIGN PARAMETERS AND HYDRAULIC ANALYSIS

A. Water Levels

The control structure should allow, during periods of lake levels below 4,198, to maintain a water level in the area of 4,200 and a short term maximum of 4,201.

B. Flow Rate

Under these conditions the control structure should allow a flow of 4,500 cfps which is the maximum average annual flow, during the last 50 years, as measured at Collinston until 1950 and Corinne thereafter.

C. Control Structure

The road extending from the east shore of Promontory to the west dike of the pond system will have a crest width of 25 feet and elevation of 4,203, with slopes of 2:1. The construction material is sand and gravel from pits at Promontory. Construction traffic will compact the road to 98% of Proctor density. GSL built identical dikes in the same area in 1967 and only minor maintenance has been required.

Fifty (50) culverts, galvanized steel, 72x44 inches will be placed in the road with an invert elevation of 4,195. A control gate will be installed at the upstream end of each culvert. Using available tables, the flow capacity was determined as follows:

Area level 4,200 Lake level 4,198 H = 2'
50x77 cfps = 3,850 cfps

Area level 4,201 Lake level 4,198 H = 3'
50x100 cfps = 5,000 cfps

50x130 cfps = 6,500 cfps H = 4'

D. Extreme Conditions

(1) Flow Rates

Should the flow rate exceed the capacity of the culverts, the road will be breached and the water can flow freely. When the flow receeds to culvert capacity the breach will be closed and manual operation resumed.

Historical flow data for the last 50 years show that with lake levels below 4,198 only the year 1971 would have required a breach.

(2) Lake Level

As the lake level rises above 4,198 the capacity of the culverts is reduced. Should the flow rate exceed capacity and the area level approaches maximum, then the road will be breached. In the years 1950, 51, 54 and in 1972, 78, 79, 81 a breach would have prevented the area level to exceed 4,201. In the years 1952-53 and 1973-76 and 80, the lake level would have, as it did, controlled the area level with maximum elevation above 4,201.

E. Level Control in the Low Flow Periods

The culverts can be closed gradually to reduce the outflow from the area and to achieve desired levels. The limit is complete closure at which time level variations are determined by inflow, precipitation and evaporation in the area. Optimal conditions can only be achieved in close cooperation with all parties controlling flow in the Bear River.

5. MANAGEMENT

DWR will monitor inflow data and projections and determine required outflow volumes. DWR will inform GSL how many culverts should be open. GLS will operate the culverts as required, breach the road if necessary, and maintain road and culverts.

5855

Yearly discharge, in cubic feet per second

Year	W.S.P. no.	Water year ending Sept. 30					Calendar year	
		Momentary maximum		Minimum day	Mean	Runoff in acre-feet	Mean	Runoff in acre-feet
		Discharge	Date					
1889	(a)	-	-	-	-	-	-	-
1890	(a)	b8,220	May 10, 1890	610	2,353	2,088,000	2,345	2,139,000
1891	(a)	b5,000	(c)	-	1,889	1,367,000	1,847	1,338,000
1892	(a)	b6,280	(d)	1,000	2,110	1,532,000	2,097	1,522,000
1893	(a)	b6,470	May 22, 1893	673	1,968	1,425,000	1,938	1,404,000
1894	Bull.131	b7,770	June3-5, 1894	825	2,696	1,952,000	2,815	2,038,000
1895	Bull.140	b4,990	May 11, 1895	540	1,897	1,373,000	1,842	1,333,000
1896	(e)	b7,420	June14,15,1896	1,100	2,130	1,547,000	2,187	1,571,000
1897	(f)	b10,800	May23-26,1897	990	2,837	2,054,000	2,863	2,076,000
1898	(g)	b5,320	June 2-3,1898	719	2,096	1,518,000	1,973	1,427,000
1899	(h)	b6,640	(i)	848	2,635	1,908,000	2,839	2,059,000
1900	(j)	b4,650	May14,15,1900	415	1,861	1,347,000	1,705	1,235,000
1901	75	b4,950	(k)	415	1,637	1,185,000	1,588	1,150,000
1902	85,1564	b3,340	June 2,3,1902	*34	*1,199	*867,900	*1,015	*734,300
1903	100	*b4,500	Mar.16,17, 1903	31	1,083	784,200	1,235	892,400
1904	133	b6,700	May25-28,1904	270	2,195	1,593,000	2,203	1,597,000
1905	176	b2,760	May 4, 1905	10	1,007	729,300	971	701,900
1906	212	b7,080	June 2, 1906	-	#1,875	#1,358,000	#1,989	#1,440,000
1907	250	b10,200	June 11, 1907	#810	#3,529	#2,556,000	3,700	2,680,000
1908	250	b5,470	June 20, 1908	385	1,940	1,410,000	1,840	1,330,000
1909	270	b11,600	June7-10,1909	500	3,420	2,480,000	3,630	2,630,000
1910	290	b7,800	Mar. 18, 1910	20	2,380	1,720,000	2,090	1,520,000
1911	310	b8,300	Feb. 2, 1911	275	1,960	1,410,000	1,980	1,430,000
1912	330	b6,380	June 17, 1912	905	2,240	1,630,000	2,330	1,690,000
1913	360	b6,250	Apr. 10, 1913	228	1,860	1,340,000	1,790	1,300,000
1914	390	6,580	(l)	437	2,460	1,780,000	2,510	1,820,000
1915	410	2,610	Feb. 11, 1915	71	1,210	877,000	1,060	769,000
1916	440	6,340	Mar. 23, 1916	286	1,700	1,240,000	1,820	1,320,000
1917	460	8,170	May 19, 1917	398	2,740	1,990,000	2,860	2,070,000
1918	480	4,650	Mar. 13, 1918	223	1,670	1,210,000	1,600	1,160,000
1919	510	3,840	Apr. 1, 1919	62	1,360	984,000	1,300	944,000
1920	510	6,510	May 25, 1920	30	1,750	1,270,000	1,300	1,310,000
1921	530	6,760	June 18, 1921	318	2,420	1,750,000	2,460	1,780,000
1922	550	10,100	May 10, 1922	351	2,790	2,020,000	2,300	2,020,000
1923	570	6,060	June 2, 1923	516	2,510	1,820,000	2,570	1,860,000
1924	590	4,870	Apr. 16, 1924	73	1,660	1,200,000	1,490	1,080,000
1925	610	4,280	Feb. 5, 1925	80	1,490	1,080,000	1,490	1,080,000
1926	630	3,380	Apr. 9, 1926	40	1,210	874,000	1,220	882,000
1927	650	m4,310	Feb. 22, 1927	18	1,490	1,080,000	1,440	1,040,000
1928	670	m4,210	Mar. 25, 1928	19	1,210	878,000	1,220	886,000
1929	690	m4,000	Mar.12,13,1929	29	1,280	925,000	1,250	902,000
1930	705	m5,100	Feb. 20, 1930	23	945	684,000	911	659,000
1931	720	m1,720	Mar. 11, 1931	23	627	454,000	498	360,000
1932	735	m4,550	May 16, 1932	23	1,070	780,000	1,120	817,000
1933	750	m3,410	May 28, 1933	28	863	625,000	858	622,000
1934	765	m1,640	Dec. 21, 1933	17	442	319,300	415	300,400
1935	790	m2,920	May 29, 1935	18	623	451,300	616	446,000
1936	810	7,260	Apr. 26, 1936	18	1,139	826,600	1,237	897,900
1937	830	5,330	May12,13,1937	14	1,054	762,300	1,058	765,900
1938	860	5,320	Apr. 29, 1938	16	1,115	807,000	1,180	854,700
1939	880	3,940	Mar.22-23,1939	18	911	659,900	790	571,600
1940	900	3,810	Jan. 17, 1940	18	617	448,000	623	452,500
1941	930	3,810	Feb. 21, 1941	15	699	506,000	730	528,600
1942	960	3,390	May 25, 1942	17	970	702,100	967	700,400
1943	980	4,830	Apr. 23, 1943	15	1,259	911,200	1,301	942,000
1944	1010	3,650	(n)	19	958	694,200	871	632,400
1945	1040	6,210	June 10, 1945	22	1,136	822,300	1,260	912,200
1946	1060	7,160	Apr. 21, 1946	24	1,505	1,090,000	1,596	1,156,000
1947	1090	3,760	(o)	24	1,431	1,036,000	1,420	1,028,000
1948	1120	3,900	May 5, 1948	20	1,516	1,100,000	1,493	1,088,000
1949	1150	3,840	May24,25,1949	23	1,442	1,045,000	1,450	1,050,000
1950	1180	6,790	June 13, 1950	192	2,275	1,647,000	-	-

* Revised.
\# Not previously published.
a 14th Ann. Rept., Pt. 2.
b Maximum observed.
c Apr. 28, 29, May 25-27, 1891.
d May 31-June 1, 1892.
e 18th Ann. Rept., Pt. 4.
f 19th Ann. Rept., Pt. 4.
g 20th Ann. Rept., Pt. 4.
h 21st Ann. Rept., Pt. 4.
i June 15, 22-27, 29, 30, July 1, 1899.
j 22nd Ann. Rept., Pt. 4.
k May 6, 19, 21, 1901
l May 27, June 6, 1914.
m Maximum daily.
n Many times in May and June 1944.
o Several days in June 1947.

Yearly discharge, in cubic feet per second

Year	WSP	Water year ending Sept. 30					Calendar year	
		Momentary maximum		Minimum day	Mean	Acre-feet	Mean	Acre-feet
		Discharge	Date					
1950	-	-	-	-	-	-	2,705	1,958,000
1951	1214	7,180	Feb. 11, 1951	203	2,502	1,811,000	2,369	1,715,000
1952	1244	7,200	May 3, 1952	183	2,445	1,775,000	2,364	1,715,000
1953	1284	3,310	June 11, 1953	90	1,487	1,077,000	1,297	939,100
1954	1344	2,570	Apr. 16, 1954	103	842	609,800	807	584,700
1955	1394	2,850	Apr. 20, 1955	101	950	687,800	1,047	758,300
1956	1444	4,130	Dec. 29, 1955	101	1,335	969,500	1,285	932,900
1957	1514	5,080	May 26, 1957	137	1,469	1,064,000	-	-
1958								
1959								
1960								

October 16, 1981

TABLE I

BEAR RIVER FLOWS - CORRINE, UTAH STATION

WATER YEARS 1964 to 1980

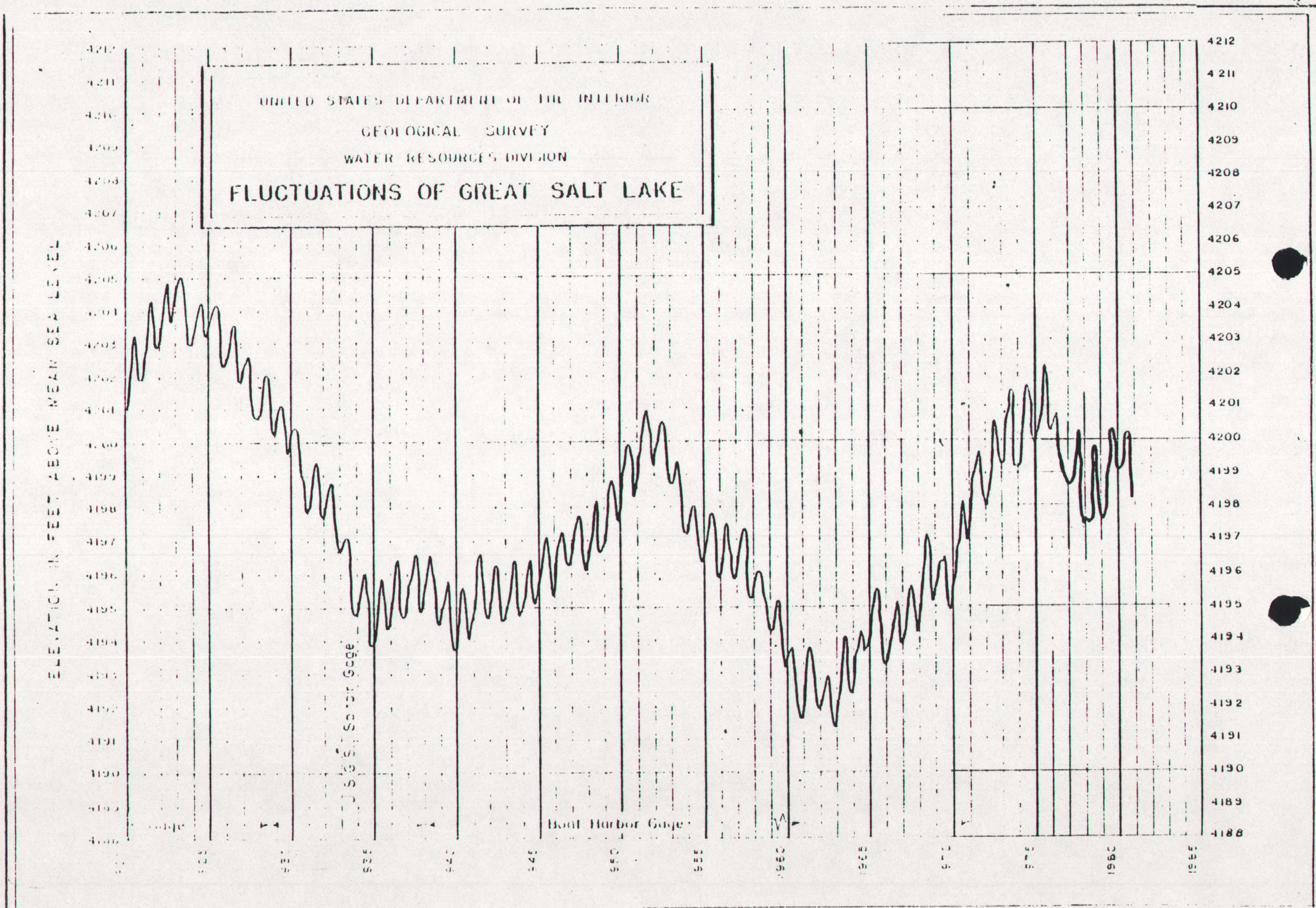
Water Year	Max. Flow CFS	Period Flow Exceeded 17 yr. Avg. 4775 CFS	Min. Flow CFS	Mean Flow CFS
1964	4260		72	1290
1965	3950		85	1633
1966	4170		74	1594
1967	4340		122	1456
1968	3950		91	1459
1969	5420	April 2-6, 11	90	1679
1970	2960		72	1210
1971	7370	April 21 to June 30	104	2856
1972	5180	April 17 - 23	102	2852
1973	3830		90	2051
1974	4340		195	2079
1975	6580	May 20 - 27	312	2012
1976	5320	April 9 - 20	72	2230
1977	3680		78	952
1978	4010		99	1303
1979	3970		108	1098
1980	7850	May 6, 13 - 19 June 4 - 17	151	2034

Avg. 17 years 4775 1752

Avg. Discharge 25 year period 1731 cfs

Note: Records for Corinne Gaging Station started 1964
Maximum Discharge since October 1949 was 7850 cfs June 8, 1980

* Records taken from Water Resource data for Utah, USGS.


UNITED STATES DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY
WATER RESOURCES DIVISION
FLUCTUATIONS OF GREAT SALT LAKE
ELEVATION IN FEET ABOVE MEAN SEA LEVEL
U.S.G.S. Saltair Gage
Boat Harbor Gage
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